Claims:

An assay method for detecting fungal infection of 1. soil or vegetables by pathogenic fungal species, in particular M. acerina, F. carotae and Pythium species, 5 said method comprising: obtaining a sample of soil or vegetable; treating said sample to lyse fungal cells therein; using an oligonucleotide primer pair, effecting a polymerase chain reaction on DNA released by lysis of the fungal 10 cells; and detecting DNA fragments generated by said polymerase chain reaction; wherein said primer pair comprises an 18- to 24-mer having the ability to hybridize to one of the oligonucleotide sequences of formulae Ia (SEQ ID NO:1), 15 Ib (SEQ ID NO:2), IIa (SEQ ID NO:3), IIb (SEQ ID NO:4), IIIa (SEQ ID NO:5), IIIb (SEQ ID NO:6), IVa (SEQ ID NO:7), IVb (SEQ ID NO:8), Va (SEQ ID NO:9), Vb (SEQ ID NO:10), VIa (SEQ ID NO:11), VIb (SEQ ID NO:12), VIIa (SEQ ID NO:13), VIIb (SEQ ID NO:14), VIIIa (SEQ ID 20 NO:15), VIIIb (SEQ ID NO:16), IXa (SEQ ID NO:17), IXb (SEQ ID NO:18), Xa (SEQ ID NO:19), Xb (SEQ ID NO:20), XIa (SEQ ID NO:21), XIb (SEQ ID NO:22), XIIa (SEQ ID NO:23), XIIb (SEQ ID NO:24), XIIIa (SEQ ID NO:25), XIIIb (SEQ ID NO:26), XIVa (SEQ ID NO:27) and XIVb (SEQ ID 25 NO:28):

```
5' - TCA CTT GTG GGG TAA AGA AGA - 3'
                                                      (Ia)
      5' - AGA CCA CAA TAA AGC GGC - 3'
                                                    (Ib)
      5' - AGT CCC GCA CAC ACA CAT - 3'
                                                      (IIa)
30
      5' - ACT TCT CTC TTT GGG GAG TGG - 3'
                                                      (IIb)
      5' - TTC GTT CAG CCT CTG CAT - 3'
                                                      (IIIa)
      5' - TCG TTT CGG CTA TGA ATA CAG - 3'
                                                      (IIIb)
      5' - ACA AAT ATA CCA ACC ACA GCG - 3'
                                                      (IVa)
      5' - TTT GTA CTT GTG CAA TTG GC - 3'
                                                      (IVb).
35
      5' - AAC GAA TAT ACC AAC CGC TG - 3'
                                                      (Va)
      5' - TCA TCT ATT TGT GCA CTT CTT TTT - 3'
                                                      (Vb)
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S		5'	-	TCT	TCT	TTA	CCC	CAC	AAG	TGA	-	3 '	(VIa)
5 ' - CCA CTC CCC AAA GAG AGA AGT - 3' (VIIb) 5 ' - ATG CAG AGG CTG AAC GAA - 3' (VIIb) 5 ' - CTG TAT TCA TAG CCG AAA CGA - 3' (VIIIa) 5 ' - CGC TGT GGT TGG TAT ATT TGT - 3' (IXa) 5 ' - CGC AAT TGC ACA AGT ACA AA - 3' (IXb) 5 ' - CAG CGG TTG GTA TAT TCG TT - 3' (Xa) 10 5 ' - AAA AAG AAG TGC ACA AAT AGA TGA - 3' (Xb) 5 ' - CGG CGT ACT TGC TCC GAC CG - 3' (Xia) 5 ' - CGG CGT ACT TGC TTC GGA GC - 3' (Xib) 5 ' - TGG GAT TAA CGG GCA GAG AC - 3' (Xib) 5 ' - CGG TCG AAG CAA AGT ACA AC - 3' (XIb) 5 ' - CGG TCG AAG CAA AGT CAA AC - 3' (XIIa) 5 ' - CGG TCG CAC ATT CGG AGG CTT CAA AC - 3' (XIIb) 5 ' - CGG TCG CAC CG ATT CAA AC - 3' (XIIb) 5 ' - CGG TCG CAA CTC ATT CAA AC - 3' (XIIb) 5 ' - CGG TCG CAA CAA CGA CGC CG - 3' (XIIb) 5 ' - CGG TCG CAA CAA CGC CG - 3' (XIIIb)		5 '	-	GCC	GCT	TTA	TTG	TGG	TCT		_	3 '	(VIb)
5 5 - ATG CAG AGG CTG AAC GAA CGA - 3 (VIIIa) 5 - CTG TAT TCA TAG CCG AAA CGA - 3 (VIIIb) 5 - CGC TGT GGT TGG TAT TGT TGT - 3 (IXa) 5 - CGC AAT TGC ACA AGT ACA AA - 3 (IXb) 5 - CAG CGG TTG GTA TAT TCG TT - 3 (Xa) 10 5 - AAA AAG AAG TGC ACA AAT AGA TGA - 3 (Xb) 5 - GTT TGA ATG GAG TCC GAC CG - 3 (Xia) 5 - CGG CGT ACT TGC TTC GGA GC - 3 (Xib) 5 - TTT CGC ATT CGG AGG CTT GG - 3 (XIIa) 5 - CGG TCG GAC TCC ATT CAA AC - 3 (XIIb) 5 - GTC CCG AAG CAA GTA CGC CG - 3 (XIIb) 5 - GTC TCT GCC CGT TAA TCC CA - 3 (XIIIb)		5'	-	ATG	TGT	GTG	TGC	GGG	ACT		-	3'	(VIIa)
S		5 '	-	CCA	CTC	CCC	AAA	GAG	AGA	AGT	-	3' .	(VIIb)
5 ' - CGC TGT GGT TGG TAT ATT TGT - 3 ' (IXa) 5 ' - GCC AAT TGC ACA AGT ACA AA - 3 ' (IXb) 5 ' - CAG CGG TTG GTA TAT TCG TT - 3 ' (Xa) 10 5 ' - AAA AAG AAG TGC ACA AAT AGA TGA - 3 ' (Xb) 5 ' - GTT TGA ATG GAG TCC GAC CG - 3 ' (Xia) 5 ' - CGG CGT ACT TGC TTC GGA GC - 3 ' (Xib) 5 ' - TGG GAT TAA CGG GCA GAG AC - 3 ' (Xib) 15 ' - TTT CGC ATT CGG AGG CTT GG - 3 ' (Xila) 15 5 ' - CGG TCG GAC TCC ATT CAA AC - 3 ' (Xila) 5 ' - GCT CCG AAG CAA GTA CGC CG - 3 ' (Xilia)	5	5 '	-	ATG	CAG	AGG	CTG	AAC	GAA		_	3 '	(VIIIa)
5' - GCC AAT TGC ACA AGT ACA AA - 3' (IXb) 5' - CAG CGG TTG GTA TAT TCG TT - 3' (Xa) 10 5' - AAA AAG AAG TGC ACA AAT AGA TGA - 3' (Xb) 5' - GTT TGA ATG GAG TCC GAC CG - 3' (Xia) 5' - CGG CGT ACT TGC TTC GGA GC - 3' (Xib) 5' - TGG GAT TAA CGG GCA GAG AC - 3' (Xila) 5' - TTT CGC ATT CGG AGG CTT GG - 3' (Xila) 5' - CGG TCG GAC TCC ATT CAA AC - 3' (Xila) 5' - GCT CCG AAG CAA GTA CGC CG - 3' (Xilia) 5' - GTC TCT GCC CGT TAA TCC CA - 3' (Xilia)		5 '	-	CTG	TAT	TCA	TAG	CCG	AAA	CGA	-	3 '	(VIIIb)
5' - CAG CGG TTG GTA TAT TCG TT - 3' (Xa) 10 5' - AAA AAG AAG TGC ACA AAT AGA TGA - 3' (Xb) 5' - GTT TGA ATG GAG TCC GAC CG - 3' (Xib) 5' - CGG CGT ACT TGC TTC GGA GC - 3' (Xib) 5' - TGG GAT TAA CGG GCA GAG AC - 3' (Xila) 5' - TTT CGC ATT CGG AGG CTT GG - 3' (Xilb) 15 5' - CGG TCG GAC TCC ATT CAA AC - 3' (Xilia) 5' - GCT CCG AAG CAA GTA CGC CG - 3' (Xilia) 5' - GCT CCG CGT TAA TCC CA - 3' (Xilia)		5 '	-	CGC	TGT	GGT	TGG	TAT	ATT	TGT	-	3 '	(IXa)
10		5'	-	GCC	AAT	TGC	ACA	AGT	ACA	AA	-	3 1	(IXb)
5' - GTT TGA ATG GAG TCC GAC CG - 3' (XIa) 5' - CGG CGT ACT TGC TTC GGA GC - 3' (XIb) 5' - TGG GAT TAA CGG GCA GAG AC - 3' (XIb) 5' - TTT CGC ATT CGG AGG CTT GG - 3' (XIIa) 5' - CGG TCG GAC TCC ATT CAA AC - 3' (XIIa) 5' - GCT CCG AAG CAA GTA CGC CG - 3' (XIIb) 5' - GTC TCT GCC CGT TAA TCC CA - 3' (XIVa)		5'	-	CAG	CGG	TTG	GTA	TAT	TCG	TT	-	31	(Xa)
5' - CGG CGT ACT TGC TTC GGA GC - 3' (X1b) 5' - TGG GAT TAA CGG GCA GAG AC - 3' (X11a) 5' - TTT CGC ATT CGG AGG CTT GG - 3' (X11b) 15 5' - CGG TCG GAC TCC ATT CAA AC - 3' (X11a) 5' - GCT CCG AAG CAA GTA CGC CG - 3' (X11b) 5' - GTC TCT GCC CGT TAA TCC CA - 3' (X1Va)	10	5 '	-	AAA	AAG	AAG	TGC	ACA	TAA	AGA TGA	-	3'	(Xb)
5' - TGG GAT TAA CGG GCA GAG AC - 3' (XIIa) 5' - TTT CGC ATT CGG AGG CTT GG - 3' (XIIb) 15 5' - CGG TCG GAC TCC ATT CAA AC - 3' (XIIb) 5' - GCT CCG AAG CAA GTA CGC CG - 3' (XIIb) 5' - GTC TCT GCC CGT TAA TCC CA - 3' (XIVa)		5'	-	GTT	TGA	ATG	GAG	TCC	GAC	CG - 3'			(XIa)
5' - TTT CGC ATT CGG AGG CTT GG - 3' (XIIb) 5' - CGG TCG GAC TCC ATT CAA AC - 3' (XIIIa) 5' - GCT CCG AAG CAA GTA CGC CG - 3' (XIIIb) 5' - GTC TCT GCC CGT TAA TCC CA - 3' (XIVa)		5 '	-	CGG	CGT	ACT	TGC	TTC	GGA	GC - 3'			(XIb)
15		5'	-	TGG	GAT	TAA	CGG	GCA	GAG	AC - 3'			(XIIa)
5' - GCT CCG AAG CAA GTA CGC CG - 3' (XIIIb) 5' - GTC TCT GCC CGT TAA TCC CA - 3' (XIVa)	-	51	-	TTT	CGC	ATT	CGG	AGG	CTT	GG - 3'		•	(XIIb)
5' - GTC TCT GCC CGT TAA TCC CA - 3' (XIVa)	15	5'	-	CGG	TCG	GAC	TCC	ATT	CAA	AC - 3'			(XIIIa)
		ا 5	-	GCT	CCG	AAG	CAA	GTA	CGC	CG - 3'			(XIIIb)
5' - CCA AGC CTC CGA ATG CGA AA - 3' (XIVb).		5'	-	GTC	TCT	GCC	CGT	TAA	TCC	CA - 3'		٠	(XIVa)
		5 '	-	CCA	AGC	CTC	CGA	ATG	CGA	AA - 3'			(XIVb).

20 A method as claimed in claim 1 for detecting fungal infection of soil by pathogenic Pythium species, said method comprising:

obtaining a sample of soil; treating said sample to lyse fungal cells therein; using an oligonucleotide primer

- 25 pair, effecting a polymerase chain reaction on DNA released by lysis of the fungal cells; and detecting DNA fragments generated by said polymerase chain reaction; wherein said primer pair comprises an 18- to 24-mer. having the ability to hybridize to one of the
- 30 oligonucleotide sequences of formulae Ia, Ib, IIa, IIb, IIIa, IIIb, IVa, IVb, Va, Vb, VIa, VIb, VIIa, VIIb, VIIIa, VIIIb, IXa, IXb, Xa and Xb:
 - 5' TCA CTT GTG GGG TAA AGA AGA 3' ' (Ia)
- 5' AGA CCA CAA TAA AGC GGC 3' 35 (Ib)
 - 5' AGT CCC GCA CAC ACA CAT 3' (IIa)
 - 5' ACT TCT CTC TTT GGG GAG TGG 3' (IIb)

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5' - TTC GTT CAG CCT CTG CAT - 3'
                                                       (IIIa)
      5' - TCG TTT CGG CTA TGA ATA CAG - 3'
                                                       (IIIb)
      5' - ACA AAT ATA CCA ACC ACA GCG - 3'
                                                       (IVa)
      5' - TTT GTA CTT GTG CAA TTG GC - 3'
                                                       (IVb)
      5' - AAC GAA TAT ACC AAC CGC TG - 3'
5
                                                       (Va)
      5' - TCA TCT ATT TGT GCA CTT CTT TTT - 3'
                                                       (Vb)
      5' - TCT TCT TTA CCC CAC AAG TGA
                                             - 3'
                                                       (VIa)
      5' - GCC GCT TTA TTG TGG TCT
                                             - 3'
                                                       (VIb)
      5' - ATG TGT GTG TGC GGG ACT
                                            - 3'
                                                       (VIIa)
      5' - CCA CTC CCC AAA GAG AGA AGT
10
                                            - 31
                                                       (VIIb)
      5' - ATG CAG AGG CTG AAC GAA
                                             - 31
                                                       (VIIIa)
      5' - CTG TAT TCA TAG CCG AAA CGA
                                             - 3'
                                                       (VIIIb)
      5' - CGC TGT GGT TGG TAT ATT TGT
                                             - 3 ·
                                                       (IXa)
      5' - GCC AAT TGC ACA AGT ACA AA
                                                       (IXb)
                                             - 31
      5' - CAG CGG TTG GTA TAT TCG TT
15
                                             - 31
                                                       (Xa)
      5' - AAA AAG AAG TGC ACA AAT AGA TGA - 3'
                                                       (Xb)
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A method as claimed in claim 1 for detecting fungal 3. infection of soil or vegetables by pathogenic fungal species, said method comprising: 20 obtaining a sample of soil or vegetable; treating said sample to lyse fungal cells therein; using an oligonucleotide primer pair, effecting a polymerase chain reaction on DNA released by lysis of the fungal 25 cells; and detecting DNA fragments generated by said polymerase chain reaction; wherein said primer pair comprises an 18- to 24-mer having the ability to hybridize to one of the oligonucleotide sequences of formulae XIa, XIb, XIIa and 30 XIIb, XIIIa, XIIIb, XIVa and XIVb:

- 38 -

5' - GTC TCT GCC CGT TAA TCC CA - 3' (XIVa)

5' - CCA AGC CTC CGA ATG CGA AA - 3' (XIVb).

4. A method as claimed in claim 2 wherein said primer pair comprises a pair of 18- to 24-mers having the ability to hybridize to a pair of the oligonucleotide sequences of formulae Ia and Ib or IIa and IIb or IIIa and IIb or IVa and IVb or Va and Vb.

- 5. A method as claimed in claim 3 wherein said primer pair comprises a pair of 18- to 24-mers having the ability to hybridize to a pair of the oligonucleotide sequences of formulae XIa and XIb or XIIa and XIIb.
- 15 6. An assay method for detecting fungal infection of soil or vegetables by pathogenic fungal species, in particular M. acerina, F. carotae and Pythium species, said method comprising:

obtaining a sample of soil or vegetable; treating said
sample to lyse fungal cells therein; using an
oligonucleotide primer pair, effecting a polymerase
chain reaction on DNA released by lysis of the fungal
cells; contacting the DNA fragments generated by said
polymerase chain reaction with a substrate having

immobilized thereon a primer which comprises an 18- to 24-mer having the ability to hybridize to one of the oligonucleotide sequences of formulae Ia, Ib, IIa, IIb, IIIa, IIIb, IVa, IVb, Va, Vb, VIa, VIb, VIIa, VIIb, VIIIa, VIIIb, IXa, IXb, Xa, Xb, XIa, XIb, XIIa, XIIb,

30 XIIIa, XIIIb, XIVa and XIVb:

5' -	TCA	CTT	GTG	GGG	TAA	AGA	AGA	_	3 '	((Ia)
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35 5' - ACT TCT CTC TTT GGG GAG TGG - 3' (IIb)

5' - TTC GTT CAG CCT CTG CAT - 3' (IIIa)

5' - TCG TTT CGG CTA TGA ATA CAG - 3' (IIIb)

^{5&#}x27; - AGT CCC GCA CAC ACA CAT - 3' (IIa)

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5' - ACA AAT ATA CCA ACC ACA GCG - 3'
                                                      (IVa)
      5' - TTT GTA CTT GTG CAA TTG GC - 3'
                                                      (IVb)
      5' - AAC GAA TAT ACC AAC CGC TG - 3'
                                                      (Va)
      5' - TCA TCT ATT TGT GCA CTT CTT TTT - 3'
                                                      (Vb)
      5' - TCT TCT TTA CCC CAC AAG TGA
                                                      (VIa)
                                            - 31
5
      5' - GCC GCT TTA TTG TGG TCT
                                            - 3'
                                                      (VIb)
      5' - ATG TGT GTG TGC GGG ACT
                                                      (VIIa)
                                            - 3'
      5' - CCA CTC CCC AAA GAG AGA AGT
                                            - 3'
                                                      (VIIb)
      5' - ATG CAG AGG CTG AAC GAA
                                            - 3'
                                                      (VIIIa)
                                            - 3'
      5' - CTG TAT TCA TAG CCG AAA CGA
                                                      (VIIIb)
10
      5' - CGC TGT GGT TGG TAT ATT TGT
                                                      (IXa)
                                            - 31
      5' - GCC AAT TGC ACA AGT ACA AA
                                            - 3'
                                                      (IXb)
                                                      (Xa)
      5' - CAG CGG TTG GTA TAT TCG TT
                                            - 3'
      5' - AAA AAG AAG TGC ACA AAT AGA TGA - 3'
                                                      (Xb)
      5' - GTT TGA ATG GAG TCC GAC CG - 3'
                                                      (XIa)
15
      5' - CGG CGT ACT TGC TTC GGA GC - 3'
                                                      (XIb)
                                                      (XIIa)
      5' - TGG GAT TAA CGG GCA GAG AC - 3'
      5' - TTT CGC ATT CGG AGG CTT GG - 3'
                                                      (XIIb)
                                                      (XIIIa)
      5' - CGG TCG GAC TCC ATT CAA AC - 3'
      5' - GCT CCG AAG CAA GTA CGC CG - 3'
                                                      (XIIIb)
20
      5' - GTC TCT GCC CGT TAA TCC CA - 3'
                                                      (XIVa)
      5' - CCA AGC CTC CGA ATG CGA AA - 3'
                                                      (XIVb);
      and detecting DNA fragments binding to said primer.
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- 7. An 18- to 24-mer oligonucleotide primer hybridizable to an oligonucleotide sequence selected from those of formulae Ia, Ib, IIa, IIb, IIIa, IIIb, IVa, IVb, Va, Vb, VIa, VIb, VIIa, VIIb, VIIIa, VIIIb, IXa, IXb, Xa, Xb, XIa, XIb, XIIA, XIIb, XIIIa, XIIIb, XIVa and XIVb.
 - 8. A primer as claimed in claim 7 hybridizable to an oligonucleotide sequence selected from those of formulae Ia, Ib, IIa, IIb, IIIa, IIIb, IVa, IVb, Va, Vb, VIa, VIb, VIIa, VIIIb, VIIIb, IXa, IXb, Xa and Xb.
 - 9. A primer as claimed in claim 7 hybridizable to an

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oligonucleotide sequence selected from those of formulae XIa, XIb, XIIa, XIIb, XIIIa, XIIIb, XIVa and XIVb.

- 10. A primer as claimed in claim 7 wherein said primer comprises a sequence of formulae Ia, Ib, IIa, IIb, IIIa, IIIb, IVa, IVb, Va, Vb, VIa, VIb, VIIa, VIIb, VIIIa, VIIIb, IXa, IXb, Xa, Xb, XIa, XIb, XIIa, XIIb, XIVa or XIVb or a derivative thereof.
- 11. A substrate having immobilized thereon at least one 18- to 24-mer oligonucleotide primer hybridizable to an oligonucleotide sequence selected from those of formulae Ia, Ib, IIa, IIb, IIIa, IIIb, IVa, IVb, Va, Vb, VIa, VIb, VIIa, VIIb, VIIIa, VIIIb, IXa, IXb, Xa, Xb, XIa, XIb, XIIA, XIIb, XIIIa, XIIIb, XIVa and XIVb.
 - 12. A substrate as claimed in claim 11 wherein said primer comprises a sequence of formulae Ia, Ib, IIa, IIb, IIIa, IIIb, IVa, IVb, Va, Vb, VIa, VIb, VIIa, VIIb, VIIIa, VIIIb, IXa, IXb, Xa, Xb, XIa, XIb, XIIa, XIIb, XIIIa, XIIIb, XIVa or XIVb or a derivative thereof.
- 13. A primer composition comprising a pair of 18- to 24-mer oligonucleotide primers at least one of which is hybridizable to an oligonucleotide sequence of formula Ia, Ib, IIa, IIb, IIIa, IIIb, IVa, IVb, Va, Vb, VIa, VIb, VIIa, VIIb, VIIIa, VIIIb, IXa, IXb, Xa, Xb, XIa, XIb, XIIa, XII, XIIIa, XIIIb, XIVa or XIVb optionally together with a carrier.

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14. A primer composition as claimed in claim 13 wherein at least one of said pair is a primer comprising a sequence of formulae Ia, Ib, IIa, IIb, IIIa, IIIb, IVa, IVb, Va, Vb, VIa, VIb, VIIa, VIIb, VIIIa, VIIIb, IXa, IXb, Xa, Xb, XIa, XIb, XIIa, XIIb, XIIIa, XIIIb, XIVa or XIVb or a derivative thereof.

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A composition as claimed in claim 13 comprising a pair of 18- to 24-mer oligonucleotide primers at least one of which is hybridizable to an oligonucleotide sequence of formula Ia, Ib, IIa, IIb, IIIa, IIIb, IVa, IVb, Va, Vb, VIa, VIb, VIIa, VIIb, VIIIa, VIIIb, IXa, IXb, Xa or Xb.

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- A composition as claimed in claim 13 comprising a pair of 18- to 24-mer oligonucleotide primers at least one of which is hybridizable to an oligonucleotide 10 sequence of formulae XIa, XIb, XIIa, XIIb, XIIIa, XIIIb, XIVa or XIVb.
- A kit for the performance of the assay method of 17. any one of claims 1 to 5, said kit comprising at least 15 one primer pair as defined in any one of claims 1 to 5 together with instructions for the performance of the assay method.
- A process for the extraction of nucleic acid from 20 soil which process comprises:
 - 1) contact a sample of about 0.1 to 1g, preferably about 0.5q, soil taken from a mixed sample of at least 100g, preferably at least 200g, soil with a fungal cell lysing agent;
 - centrifuge at least 10000xg for at least 10 minutes 2) and collect the supernatant;
 - 3) contact the supernatant with a particulate DNAbinding agent;
- centrifuge and collect the DNA-bearing particulate; 30 4)
 - suspend the particulate in an aqueous solution of a 5) chaotropic agent (e.g. aqueous guanidine thiocyanate solution), centrifuge and collect the DNA-bearing particulate;
- repeat step (5) at least once; 35 6)
 - suspend the particulate in aqueous salt/ethanol 7) wash solution, centrifuge and collect the DNA-

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bearing particulate;

- 8) repeat step (7) at least once;
- 9) suspend the particulate in an aqueous solution of a DNA-release agent;
- 5 10) centrifuge and collect the DNA-containing supernatant; and optionally
 - 11) resuspend the particulate in an aqueous solution of a DNA-release agent, centrifuge and collect and combine the supernatant.

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- 19. A kit for nucleic acid extraction from soil, which kit comprises:
- i) an aqueous fungal cell lysing agent;
- 15 ii) a DNA-binding particulate;
 - iii) an aqueous solution of a chaotropic agent (e.g.
 guanidine thiocyanate);
 - iv) an aqueous solution of salt and ethanol; and
- v) an aqueous solution of a DNA-release agent;
 20 together with instructions for the use of said kit
 in the process of claim 13.
 - 20. A process for the extraction of pathogen DNA from host vegetable tissue, which process comprises:

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- i) contact at least 20 mg of dry powdered plant tissue (preferably surface tissue such as peel) with at least 5 μ L/mg dry tissue of an aqueous fungal cell lysing agent;
- 30 ii) incubate;
 - iii) mix with at least 4.5 μ L/mg dry tissue of an aqueous solution of a protein and polysaccharide precipitating agent;
 - iv) centrifuge and collect DNA-containing
 supernatant;
 - v) filter;
 - vi) contact DNA-containing filtrate with a DNA-

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		binding substrate and centrifuge;
	vii)	wash the DNA-carrying substrate with an
		aqueous ethanolic solution, centrifuge and
		remove the liquid phase;
5	viii)	repeat step (vii) at least once;
	ix)	dry the DNA-carrying substrate; and
	x)	contact the substrate with an aqueous solution
		of a DNA release agent, centrifuge and collect
		the DNA-containing supernatant.
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- 21. A kit for pathogen DNA extraction from host vegetable tissue, which kit comprises:
- a) a fungal cell lysing agent;
- 15 b) an aqueous solution of a protein and polysaccharide precipitating solution;
 - c) a DNA-binding substrate;
 - d) an aqueous ethanolic wash solution; and
 - e) an aqueous solution of a DNA release agent;

20

together with instructions for the use of said kit for pathogen DNA extraction from host vegetable tissue.